

**REMARKS**

This Amendment is being filed as a supplement to the Response filed September 20, 2010. Claim 1 is amended to incorporate the subject matter of claims 6 and 7. In view of the amendment to claim 1, claims 6 and 7 are canceled, and claims 8 and 10 are amended to depend from claim 1. Claim 4 is amended to recite that the gas flow through the inlet opening corresponds to “equation (2A)” to distinguish it from the gas flow through the outlet opening which corresponds to “equation (2B)” as recited in amended claim 1. No new matter is presented.

The Examiner is respectfully requested to consider the presently amended claims and the following remarks in conjunction with the Remarks of the Response previously filed September 20, 2010, which are incorporated herein by reference.

**Response to Claim Rejections under 35 U.S.C. § 112, 2<sup>nd</sup> Paragraph**

At page 2 of the Office Action, claim 10 is rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite.

According to the Examiner, there is no antecedent basis for “the flow of gas caused by the chimney effect” or “the chimney effect” in claim 10.

Applicants traverse and respectfully request the Examiner to reconsider in view of the following remarks.

Claim 10 is amended to depend from claim 1. Claim 1 provides sufficient antecedent basis for the subject matter of claim 10.

Accordingly, withdrawal of the § 112, second paragraph, rejection of claim 10 is respectfully requested.

**Response to Rejections under 35 U.S.C. § 102 and § 103**

At page 3 of the Office Action, claims 1-8, 11-13 and 16 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 6,192,715 (Orita).

At page 6 of the Office Action, claims 9-10, 14 and 15 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Orita.

The Examiner cites Orita as expressly or inherently anticipating the presently claimed invention as recited in claims 1-8, 11-13 and 16. Further, the Examiner cites Orita as rendering obvious the presently claimed invention as recited in claims 9, 10, 14 and 15.

Applicants traverse the rejections for the reasons of record and additionally as follows.

Applicants respectfully submit that the presently claimed invention is not anticipated or rendered obvious by Orita because Orita fails to explicitly or inherently disclose or suggest each and every element of the presently claimed invention, and a person having ordinary skill in the art would not have arrived at the presently claimed invention in view of Orita.

The present invention relates to a method of subjecting a glass preform to processing by tensile forces in a furnace to produce a glass product of predetermined shape, as recited in present claim 1. The method comprises a) introducing at least a part of the glass preform into the furnace through an inlet opening, b) heating a portion of the glass preform introduced into the furnace to a temperature above a softening point of the preform, c) subjecting the heated portion of the glass preform to tensile forces in a drawing direction to process the preform into the predetermined shape, d) drawing the portion of the preform which has been processed into the predetermined shape from the furnace through an outlet opening, and e) flushing the heated portion of the preform and at least a part of the processed portion of the preform in the furnace with inert gas which is being fed into the furnace. The method is characterized by maintaining a

concentration of gaseous impurities in the furnace essentially the same as a concentration of the same impurities in the inert gas fed into the furnace; establishing a diffusion barrier against an inflow of impurities from the ambient air, driven by diffusion, by generating a barrier flow of inert gas in at least one opening selected from said inlet opening and said outlet opening of the furnace, said barrier flow having a direction of flow, which is generally opposite to the inflow of the impurities; and introducing the flow of inert gas into the outlet opening, the flow being at least equal to the flow of gas caused by a chimney effect through the inlet opening, preventing unwanted suction of ambient air into furnace through outlet opening due to chimney effect. The flow of inert gas into the furnace is sufficient still to form, based on the gas flow according to equation (2B), a diffusion barrier at the outlet opening of the furnace. Equation (2B) has the formula  $F_1 = F * C_1 / (C_1 + C_2 + C_3)$ , wherein  $F_1$  stands for the protective gas flow through the inlet opening,  $F$  stands for the total gas flow,  $C_1$  stands for a conductance of the inlet opening and  $C_2$  stands for a conductance of the outlet opening,  $C_3$  stands for a combined conductance of flow routes from furnace to ambient space other than inlet opening or outlet opening.

At page 8 of the Office Action, the Examiner indicates that Orita has a diffusion barrier even though Orita does not call it such.

Applicants disagree.

There are two kinds of barriers that can be formed in inlets of a glass processing furnace: diffusion barrier and pressure difference barrier. A diffusion barrier, as disclosed in the present invention, involves gaseous impurities, such as oxygen, in the molecule scale and against individual molecules which are driven by the forces of diffusion. In contrast, a pressure difference does not necessarily result in a diffusion barrier. However, if the gaseous

concentration difference, for example, of oxygen, between the interior of the furnace and the ambient air is high, the diffusion effect is significant.

The presently claimed invention relates to establishing a diffusion barrier against an inflow of impurities from the ambient air, driven by diffusion, by generating a barrier flow of inert gas in at least one opening selected from the inlet opening and the outlet opening of the furnace, and the barrier flow having a direction of flow, which is generally opposite to the direction of the impurities.

According to the present invention, any unwanted gaseous molecule contents can be kept outside the furnace by using a flow of inert gas to form a diffusion barrier (sealing condition). The content of residual is accepted to correspond essentially to (e.g., being slightly in excess of) the level of impurity of the protective gas, for example, and a sealing flow opposite to the diffusion is arranged by means of the sealing flow, forming a sufficient diffusion seal by means of the sealing distance used (see pages 8-9 of the present specification). In order to do this, the presently claimed invention comprises a furnace assembly having aggregates (which use flows and structural parts that are designed so that the distribution of gases is taken into account in the proportions of conductances), non-contacting sealing by means of a diffusion barrier (sealing condition), possible flow rate and direction of flow over the aggregate conductances (provided by the chimney effect), and combining the above-mentioned flows to define sealing distances needed.

In the present invention, the molecule scale and the concentration difference are explicitly disclosed in the present claims, “concentration of gaseous impurities...same as impurities in the inert gas...” and “impurities from the ambient air”. Oxygen is not inert and is thus an impurity. Additionally, various methods of calculating the number of flows, of

calculating the chimney effect, of calculating the flow rates and direction in the aggregates in order to achieve the effects of the presently claimed invention are explicitly disclosed in the present claims.

Orita is does not disclose or suggest establishing a diffusion barrier against an inflow of impurities from the ambient air, driven by diffusion, by generating a barrier flow of inert gas in at least one opening of the furnace as recited in present claim 1. Additionally, Orita does not disclose, teach or suggest calculating the number of flows, calculating the chimney effect, calculating the flow rates, direction in the aggregates, etc., as recited in the presently claimed invention.

Further, the Examiner has not met his burden of providing a reasonable technical basis for asserting that a diffusion barrier is necessarily present, and thus, inherent in Orita. Even though a high enough pressure difference may result in a diffusion barrier, Orita does not sufficiently disclose teachings, for example, dimensioning of orifices, taking into account chimney effect, etc., as recited in the present claims, to establish that a diffusion barrier is inherently present, and inherency may not be established by probabilities or possibilities or the fact that a certain result or characteristic may occur or be present in the prior art. Instead, the Examiner appears to use Applicants' claim language and the teachings of the present invention to extrapolate the teachings of Orita to conclude that Orita expressly or inherently teaches or suggests the presently claimed invention. However, Orita does not expressly or inherently disclose or suggest the present invention as a whole.

At page 4 of the Office Action, the Examiner indicates that the equation of claim 4 and the equation of claim 7 are the same, and thus, claim 7 is met for substantially the same reason claim 4 is met.

Applicants respectfully traverse.

Claim 1 which is amended to incorporate the subject matter of claim 7 recites the flow of gas through the outlet opening, corresponding to equation (2B). In contrast, claim 4 recites the flow of gas through the inlet opening, corresponding to equation (2A).

Orita fails to expressly or inherently anticipate the presently claimed invention as recited in claims 1-8, 11-13 and 16. Further, Applicants submit that claims 9-10 and 14-15 ultimately depend from claim 1 and are not rendered obvious by Orita for at least the reasons that Orita does not disclose all elements of claim 1 and there is no apparent reason to modify the disclosure of Orita to arrive at the claimed invention. Accordingly, withdrawal of the § 102 rejection of claims 1-8, 11-13 and 16 and the § 103 rejection of claims 9-10 and 14-15 is respectfully requested.

### **Claim 35**

Claim 35 recites that the barrier flow of inert gas is laminar. The Examiner did not provide comments with respect to claim 35 in the Office Action dated April 20, 2010. However, Applicants submit that claim 35 depends from claim 1 and is patentable at least by virtue of its dependency from claim 1.

### **Conclusion**

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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